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ABSTRACT

Early adolescent alcohol use and abuse has become a public health issue. Research studies indicate that early adolescent drinking may lead to emotional, social, and academic impairments, health and developmental problems, and even death. This study emphasized the need to better understand the predisposing triggers of adolescent alcohol use (especially factors that increase the child's probability of associating with antisocial peers) in order to identify effective prevention and intervention programs. The study proposed a social process model of adolescent drinking behavior, which focuses on factors within the family that promote deviant peer relations and specifically addresses the role of siblings in family risk factors. A 4-year investigation of 371 families found that there are important connections among sibling, parent, and target adolescent drinking behavior. Substance abuse problems among mothers had strong concurrent and delayed indirect influences on their adolescent children. Study findings also supported the theory that frequent and problematic drinking by siblings exacerbate the adolescent participant's tendency to drink. This influence was found to be concurrent in near-age siblings and indirect in terms of the target adolescent's selection of friends who drink. The study concluded that the abuse of alcohol by parents is only part of the total influence on an adolescent, and that the behavior of siblings is an important risk factor for adolescent drinking problems. (Contains 31 references.) (SD)

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Siblings, Parents, and Peers: A Longitudinal Study of Social Influences in Adolescent Risk for Alcohol Use and Abuse*

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Early adolescents experiment with a range of socially proscribed behaviors, including the use of alcohol. Although some sampling of typically adult activities appears to be normative and perhaps even developmentally appropriate during this

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period, the initiation of drinking at this time in life brings with it increased risk for later problems with alcohol and other substances (Hawkins, Lishner, Catalano, & Howard, 1986; Kandel, 1975; Kandel, Kessler, & Margulies, 1978; Kumpfer & Demarsh, 1986; Svanum & McAdoo, 1991). Moreover, early experimentation with alcohol is related to a broad constellation of problem behaviors such as minor delinquencies or sexual involvements that often have adverse developmental consequences (Jessor & Jessor, 1977; National Institute on Alcohol Abuse and Alcoholism, 1990). Early initiation of deviant or antisocial behaviors, such as early-onset drinking, can also lead to significant developmental problems during middle and late adolescence, thus making difficult a successful transition to adulthood (Sampson & Laub, 1993).

Taken together, prior research findings indicate that early adolescent drinking may lead to chronic impairments in both emotional functioning and social relationships (Coombs, Paulson, & Palley, 1988). Adolescent alcohol use also increases risk for physical health problems. For example, adolescents who drink are more likely to be involved in accidents that produce significant injuries or even death (National Institute on Alcohol Abuse and Alcoholism, 1990). Indeed, reckless driving, which often involves the abuse of alcohol, is a leading cause of death and disability for youth. These negative effects of alcohol use and abuse have become so pervasive that they constitute a major public health problem (Adams, Blanken, Ferguson, & Kopstein, 1990).

Despite this significant negative influence, research to date has not clearly identified either the precursors of early-onset drinking or factors that lead to increased alcohol use from early to later adolescence. Yet, better understanding of such predisposing mechanisms will be needed in order to develop more effective prevention or intervention programs designed to reduce the incidence of adolescent alcohol use and abuse. In this report we propose and evaluate a social process model of adolescent drinking behavior in an effort to add to the available knowledge base regarding this important social and developmental phenomenon. In particular, the study addresses an important but largely neglected issue in research on adolescent alcohol use, the role of siblings in family risk for early drinking (Barnes, 1990).

A SOCIAL PROCESS MODEL OF ADOLESCENT DRINKING

Although several decades of research on adolescent problem behaviors has focused primarily on peer influences, recently investigators increasingly have turned their attention to family factors that both exacerbate child maladjustment and increase the child's probability of associating with deviant or antisocial peers (Elliott, in press; Gottfredson & Hirschi, 1990; Melby, Conger, Conger, & Lorenz, 1993; Patterson, Reid, & Dishion, 1992; Simmons & Blyth, 1987; Steinberg, Mounts, Lamborn, & Dornbusch, 1991; Youniss & Smollar, 1985). These researchers suggest that the dynamics of family life during childhood and early adolescence play an important role in promoting a developmental trajectory that either (a) fosters youth competencies that reduce the probability of associating with deviant friends, or that (b) intensifies antisocial behaviors that increase the likelihood of entering into relationships with similar peers.

In this chapter we focus on factors within the family that promote deviant peer relations, and we suggest three avenues through which adolescents may acquire alcohol-using friends. The behavior of other family members, including parents and siblings, is expected to increase directly the risk of choosing friends who drink. We also believe that the target adolescent's own drinking behavior will play a major role in determining his or her choice of friends. Of particular importance, our model of family influence examines the role of siblings in these processes. As Barnes (1990, p. 151) noted: "One of the most neglected areas of research regarding family influences on the development of adolescent drinking is the relationship of siblings . . . in the initiation and continuation of substance use among adolescents."

Our model of social influence (Figure 1.1) draws heavily on the work of Barnes (1990), who suggests that family processes involving siblings, parents, and adolescents affect selection into social networks involving peers outside the home. According to the model, parents promote association with alcohol-using peers primarily through their childrearing behaviors. In this investigation, we predicted that a harsh, unpredictable home environment would both increase the attractiveness of peer

relations and fail to prevent association with peers who are engaging in risky behaviors such as alcohol use (Conger, 1976; Patterson et al., 1992). That is, parents who are harsh and irritable reduce the positively reinforcing nature of the home environment, thus increasing the value of positive interactions with peers outside the home. Moreover, parents who fail to monitor the types of friends with whom their adolescent associates, and who inconsistently enforce rules about inappropriate peer relations, increase the risk that their child will develop friendships with others who are engaged in deviant activities. Additionally, several studies have shown that hostile and rejecting parenting behavior and harsh, inconsistent discipline directly predict adolescent substance use (Barnes, 1990; Conger, et al., 1991; Hawkins, Catalano, & Miller, 1992; Jones & Houts, 1990; Patterson, 1986). Thus, as shown in Figure 1.1, we also predicted a direct path from negative parenting behaviors to adolescent drinking.

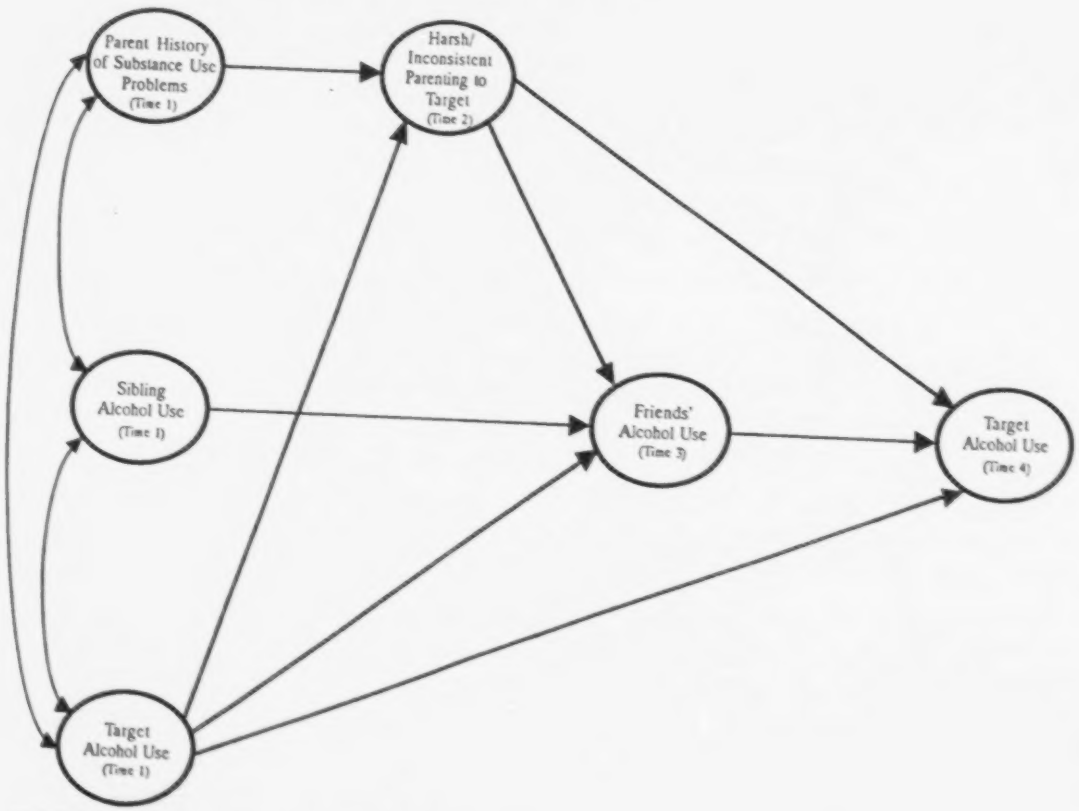
Parent History of Substance Use Problems (Time 1)
Harsh/ Inconsistent Parenting to Target (Time 2)
Sibling Alcohol Use (Time 1)
Friends' Alcohol Use (Time 3)
Target Alcohol Use (Time 4)
Target Alcohol Use (Time 1)

FIGURE 1.1 The theoretical model.

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Previous research has shown that, under stressful conditions, parents are more likely to engage in the types of harsh and inconsistent behaviors just described. In difficult circumstances, parents may (a) be less capable as agents of socialization (Patterson, DeBaryshe, & Ramsey, 1989), and (b) model inappropriate and coercive behaviors that would be detrimental if emulated by the child (Christensen & Margolin, 1988; Jourilies, Murphy, & O'Leary, 1989). A parent's history of significant substance use, we expected, would be one indication of greater risk for a variety of psychological problems and the attendant life stresses they produce (e.g., Chassin, Pillow, Curran, Molina, & Barrera, 1993). Consistent with recent findings reported by Chassin and her colleagues (1993), we also expected that parental substance use in general (i.e., use of alcohol, drugs, and/or tobacco) rather than alcohol use alone would suggest greater parental stress. Early initiation of drinking behavior by the target adolescent also was predicted to be another chronic stressor for parents, having the capacity to disrupt the parent's childrearing behaviors toward the youth (see also Patterson et al., 1989). Thus, as shown in Figure 1.1, we expected that parents experiencing chronic stress due to both their own past or present difficulties with substances and their adolescent's drinking problems would be more likely to take a harsh and inconsistent approach to parenting.

Of particular importance for the present study, the second proposed vehicle for promoting association with peers who drink is sibling drinking behavior. We expected that, net of the parental and adolescent influences just discussed, siblings who drink would serve as models for use and also as potential sources of encouragement to use. Earlier research has demonstrated the possibility of such influences both from older to younger siblings and from younger to older brothers and sisters (Brook, Whiteman, Gordon, & Brenden, 1983; Lauritsen, 1993). Thus, according to the model (Figure 1.1), siblings provide an avenue for social learning and reinforcement of drinking behavior as suggested by several theorists (e.g., Bandura, 1977; Patterson et al., 1992). We propose that their drinking behavior also legitimizes associating with same-age peers outside the family who drink, as indicated by the path from sibling to friend's alcohol use. Indeed, consistent with Barnes (1990), the theoretical model suggests that across time, friends' use should be the most proximal factor in adolescent drinking; thus, we hy-

pothesize that sibling drinking will have an indirect influence, through peer relations, on later adolescent alcohol use.

Finally, we hypothesized that the target adolescent's own early alcohol use would be associated with selection into social groups that include alcohol-using peers. As has long been noted in the literature, antisocial youth tend to "flock together," presumably because these associations will reinforce existing behavioral repertoires, and also because they are more likely to be rejected by more conventional peers (Gottfredson & Hirschi, 1990; Patterson et al., 1992). Furthermore, the model also predicts continuity in the target adolescent's drinking behavior over time, a well-established empirical generalization (Jessor, Donovan, & Costa, 1991; Sampson & Laub, 1993). Overall, however, we expected that friends who drink would have the most powerful direct impact on later target alcohol use (Elliott, Huizinga, & Menard, 1989), and that as adolescents move from the family to the world outside the family, their closest friends will have an increasingly powerful influence on their social behaviors.

Methodological Issues in Testing the Model

In addition to the substantive issues addressed by the study, an important feature of the research design is the inclusion of reports by multiple family members. Most research on adolescent substance use involves information provided only by a single respondent, usually the adolescent. This measurement approach can produce significant upward bias in estimation of structural parameters for a specific theoretical model (Bank, Dishion, Skinner, & Patterson, 1990; Lorenz, Conger, Simons, Whitbeck, & Elder, 1991). For example, with results based on reports by a single respondent, it is difficult to determine whether a strong relation between sibling and adolescent drinking reflects the real state of affairs or whether it is based on the rationalization of heavy drinkers that others are drinking as well. To overcome this problem, in the following analyses parents, siblings, and target adolescents independently reported their involvements with alcohol. In addition, both target adolescents and siblings reported on the target's degree of involvement with friends who drink. Moreover, the measures of parenting behavior were based on ratings by multiple family members as well as by independent project observers. Finally,

we evaluated the theoretical model using a longitudinal research design, which allows stronger inferences about directions of influence than does the more typical cross-sectional approach (e.g., Chassin et al., 1993).

METHOD

Sample

At the first interview in 1989, the sample for these analyses included 451 families. We used listwise deletion of missing data across four years of data collection to obtain the final sample of 371 families with complete data for the mothers' analyses and 368 families with complete data for the fathers' analyses. These were white, primarily lower-middle and middle-class families. Because of the rural focus of the study, all families lived in small towns or the countryside. Specifically, 34% lived on a farm, 12% lived outside a town but not on a farm, and 54% lived in a town with a population no greater than 6,500. During the first year of the study, each family included two parents, a seventh-grade target adolescent (M age = 12.7 years), and a near-aged sibling. For the mother's analyses, 200 of the seventh graders were girls and 171 were boys. There were 197 seventh-grade girls and 171 seventh-grade boys for the father's analyses. The average family size was 4.95 members, and family median income for 1988 was $33,399.

Participants were interviewed in four successive years, 1989 (when the target adolescent was in seventh grade), 1990, 1991, and 1992. The retention rate for each year of data collection was about 95%. Families who withdrew from the study were, in most respects, similar to those who remained in the study. In terms of education, however, fathers who dropped out averaged 12.74 years of education, whereas those who remained in the study averaged 13.58 years. This difference was statistically significant ($p < .05$). Mothers who dropped out averaged 12.87 years of education, which was not significantly different from the 13.48 years of education for mothers who stayed in the study. Other longitudinal studies of families with adolescents also reported greater attrition of less educated parents (e.g., Flanagan & Eccles, 1993).

Procedures

The families in this study were recruited through all 34 public and private schools with a seventh-grade class in selected communities in eight counties. Names and addresses of seventh-grade students and their parents were obtained from all schools in communities of 6,500 or less. After receiving a letter explaining the project, families were contacted by telephone and asked to participate. About 78% of the eligible families agreed to take part in the study. Each participating family member was paid approximately $10 per hour of participation.

Each year of the study, families were visited twice in their own homes. During the first visit, each of the four family members completed a set of questionnaires focusing on, among other things, family member and family interaction characteristics. The second visit occurred within two weeks of the first. A trained interviewer began the second visit by asking both parents and the two children to complete independently a checklist designed to identify current disagreements or conflicts between the parents and children. Potential areas of disagreement included household chores, homework, transportation, and so on. After completing the checklists, family members were asked to gather around a table for the videotaping of four different structured interaction tasks.

For the general interaction task (task 1), family members were given a set of cards containing questions about areas of their family life such as parenting, performance in school, household chores, and important family events. The topics on the cards were similar to those covered in the questionnaires. For example, one question asked the target child to describe what his or her parents usually did when he or she got into trouble for doing something wrong. For all cards, participants were asked to discuss their answers with one another.

As for all four tasks, the interviewer explained the task procedures, completed a practice card with the family, and checked the videorecording equipment before leaving the room for another part of the house. The family spent a total of 35 minutes discussing the task 1 cards. The problem-solving task (task 2) began shortly thereafter and lasted 15 minutes. During this task, family members discussed and attempted to resolve up to three problems identified on the previously completed questionnaires. The third task involved only the two siblings and lasted 15 minutes. The two children discussed topics such as

things they do together, school activities, and their plans for the future. During the sibling interaction task, the parents completed questionnaires in another room. For the fourth task, the husband and wife spent 30 minutes discussing several topics including the history and status of their relationship, areas of agreement or disagreement, and their plans for the future. Meanwhile, the two children worked on questionnaires in another room. The analyses reported here used observational data collected from task 1 in the study's second year, and questionnaire responses from the first, second, third, and fourth years.

The videotaped family interactions were coded by trained observers, who rated several dimensions of family interaction and individual member characteristics. The observers received two months of training and passed extensive written and viewing tests before coding videotapes. Approximately 25% of all tasks were randomly assigned to be coded by a second, independent, reliability coder. Following procedures recommended by Suen and Ary (1989), intraclass correlations were used to estimate interobserver reliability for each rating scale. An observer rating manual with complete definitions for all rating scales and descriptions for all task procedures is available from the first author.

Measures

Parents' History of Substance Use Problems. We have postulated (see Figure 1.1) that a key factor in predicting adolescent alcohol use is the parents' history of substance use problems. Three indicators, each composed of reports from both parents, were used to measure past and present parental substance use and associated problems. First, each parent reported on his or her own past use of alcohol. Parents were asked if they had "ever had enough alcohol at one time to get drunk?", and also if there was ever "a time in your life when you or someone you were close to felt you had a drinking problem?" As was the case with all of the parents' substance use self-report items, these questions were answered either yes or no (no = 1, yes = 2). Each parent also reported on his or her spouse's past use of alcohol. Parents were asked if their spouses had ever "had problems with alcohol" during the time the couple had been married. Responses to this question, as well as to the remaining spouse-report questions, ranged from 1 = *strongly disagree* to 5 = *strongly agree*.

Three self-report and two spouse-report items were used to measure past illegal use of drugs or overuse of prescription pills. Parents reported if they had ever used illegal drugs, ever used them on a regular basis, and if "you or someone you were close to felt you had a drug problem from using too many prescription or illegal drugs." Each parent was also asked if his or her spouse ever "had problems from taking too many prescription drugs" and "problems with illegal drugs." For the final indicator of parent substance use problems, we asked parents whether or not they had ever smoked or chewed tobacco. We also obtained spouse reports of "health problems from tobacco use."

All three indicators of parent substance use problems are summed indexes. When creating these measures, correlations between the self- and spouse-report items were first examined. In all cases, the correlations were statistically significant ($p < .05$). For example, the correlation between the mother's self-report of her smoking and her spouse's report of her smoking problems was .53 ($p < .01$), whereas the father's smoking self-report correlated .46 ($p < .01$) with his spouse's report of his smoking problems. Having judged the self- and spouse-report items to be satisfactorily correlated, we standardized all responses and summed the related items to form the three indicators. Internal consistency for the scales ranged from $\alpha = .68$ (father's past drug use problems) to $\alpha = .43$ (mother's past drug use problems). For most parents who had a history of substance use problems, these events occurred sometime in the past. For some of them, however, these were ongoing difficulties.

Target and Sibling Alcohol Use. The constructs for alcohol use by the target and his or her sibling were based on two different indicators. The first indicator involved a self-reported count of the youth's drinking frequency during the past year (0 = *never* to 4 = *3 or more times per week*). Each teenager answered three questions indicating how often he or she used three kinds of alcohol: (a) beer, (b) wine or wine coolers, and (c) hard liquor. These responses were summed to create the frequency indicator for the construct. The second indicator was based on the summed responses to 11 items describing problems associated with drinking. The difficulties measured included such things as getting drunk, getting into trouble with parents or friends, having problems at school, and so on. Each teenager indicated whether, during the past year (1 = *never* to 4 = *more than 3 times*), he or she had experienced

such problems. Thus, to achieve a high score on the alcohol use construct, a respondent had to be both a frequent drinker and also demonstrate evidence of social, behavioral, or instrumental impairments indicative of alcohol abuse (National Institute on Alcohol Abuse and Alcoholism, 1990).

In this report, we examined targets' alcohol use measured in the first year of the study and again in the study's fourth year. We considered siblings' alcohol use measured in the first year of the investigation. Internal consistency for these measures was above .90 in all but two cases. The two exceptions were target's frequency of use at time one (α = .71) and target's alcohol problems at time four (α = .77).

Harsh/Inconsistent Parenting to the Target. We examined two important dimensions of parenting behavior: parental management strategies and the emotional valence of parenting behavior. Management strategies that we expected to relate positively to adolescent alcohol use included inconsistent disciplinary practices and poor monitoring or tracking of adolescent activities. Regarding the emotional quality of parenting, prior research shows that when parenting takes on a hostile and/or critical quality, adolescents are at greater risk of substance use (Barnes, 1990; Conger et al., 1991; Hawkins et al., 1992). We, therefore, identified three indicators of harsh/inconsistent parenting toward the target child: (a) hostility, (b) inconsistent discipline, and (c) poor child monitoring.

To capture the full diversity of each parent's harsh and inconsistent parenting, we aggregated information across reporters as suggested by previous studies (Rushton, Brainerd, & Pressley, 1983; Schwarz, Barton-Henry, & Pruzinsky, 1985). In the study's second year, four reporters provided information for each indicator of parenting behavior. Parents reported on their own and their spouses' behavior. The target child reported on each parent's behavior, and, finally, videotape observers rated each parent's childrearing behavior. For child management items, the scale for parents' self-report items and the child-report items ranged from 1 = *never* to 5 = *always*. For parents' hostile emotions, parents and adolescents reported on a scale that ranged from 1 = *never* to 7 = *always*. The spouse reports for all behaviors were given using a scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. Observers rated each parent's behavior during the first interaction task using a scale that ranged from 1 = *not at all characteristic* of the parent to

5 = *mainly characteristic* of the parent. In all cases, informants' responses were summed and correlations among resulting indexes were examined. All correlations were statistically significant ($p < .05$) and warranted summing across respondents. Thus, for each indicator described later, all responses were standardized and summed. Additional details regarding the construction of these measures can be found in Conger, Rueter, and Conger (1994).

The first indicator of harsh and inconsistent parenting measured the amount of *hostility* directed toward the target child. Each parent answered four questions asking how often in the last month they had (a) gotten angry at, (b) criticized, (c) shouted or yelled at, or (d) argued with their child. Each parent also responded to a single item asking if his or her spouse "gets angry with the children too often." The target child responded to a series of 12 items for each parent. For example, children were asked how often each parent got angry at them, criticized them, hit them, insulted them, and so on. Finally, three observational rating scales were used to measure parental hostility. Observers rated the extent to which each parent displayed (a) hostile, (b) threatening, and (c) insensitive behavior toward the target child. Interobserver reliability was .62 for fathers and .60 for mothers. Internal consistency for the summed indicator was $\alpha = .82$ (fathers) and $\alpha = .83$ (mothers). The observer ratings for the hostility indicator were based only on family interactions occurring during task 1.

The measure of *inconsistent discipline* was constructed in a manner similar to the hostility indicator. Parents responded to four questions. For example, parents were asked how often they allowed the child to get out of doing something he or she had been asked to do and how often they disciplined the child for something one time but not for the same thing at another time. To gather the child's point of view, we asked each target child to respond to the same four items with respect to each parent's behavior. Each parent was also asked three questions about his or her spouse's disciplinary practices. Like the self-report items, each parent was asked if his or her spouse is consistent in applying discipline, if the spouse is clear about expectations (reverse coded), and if the spouse allows the child "to do too many things he or she should not do." Observers, using a single observational code, rated each parent on these aspects of parenting. The interobserver reliability coefficients were .61 (fathers) and .72 (mothers). Internal consistency for the father's

summed indicator was $\alpha = .67$ and $\alpha = .65$ for the mother's indicator. Observer ratings of discipline were based both on behaviors occurring during the interaction task and on family members' descriptions during the task of parent practices at home. For example, if both parents and children agreed that the father did not discipline in a consistent fashion when these adolescents broke rules at home, for example, regarding curfews, then the father was rated high on inconsistent discipline.

The third indicator of harsh and inconsistent discipline was *poor child monitoring*. Parents were asked how often they (a) know where their child is, (b) know who the child is with, (c) talk to the child about events in his or her life, and (d) have a set time for the child to be home or in bed. The target child also answered the same four questions about each of his or her parents. Parents were also asked if their spouses know what the child is doing and who his or her friends are, as well as if their spouses know the child's teachers and how well he or she is doing in school. Finally, observers rated each parent in terms of how well the parent knew the child's day-to-day activities, his or her friends, school activities, and so on (interobserver reliability was .51 for fathers and .51 for mothers). For fathers, internal consistency was .70. Internal consistency for the mother's indicator was .63. As with the discipline measure, observer ratings of monitoring were based both on behaviors occurring during task 1 and on family members' descriptions during the task of parents' monitoring behaviors at home.

Friends' Alcohol Use. In developing the measure of friends' alcohol use, we took into account the possibility that an association between this variable and the target's own drinking may be due, at least in part, to a perceptual bias (e.g., if the adolescent drinks, he or she thinks or rationalizes that others drink as well). To offset this possibility, we gathered information on the target adolescent's friends' use of alcohol from both the targets and their siblings. During the study's third year, the target adolescent was asked how many of his or her friends (1 = *none of them* to 5 = *all of them*) "used alcohol" and how many had "gotten drunk using alcohol." Responses to these two items were highly correlated ($r = .88$) and were summed to create the *target report* indicator of friends' alcohol use. During year 3, the sibling also was asked if the target's "friends drink or smoke a lot" (1 = *strongly disagree* to 5 = *strongly agree*). This single item became the *sibling report* of friends' alcohol use.

RESULTS

Correlational Analyses

Table 1.1 presents the correlations (decimal points omitted), means, and standard deviations for all study variables used as indicators of constructs in the evaluation of the theoretical model. Correlations above the diagonal are for models involving fathers, those below the diagonal are for analyses involving mothers. In general, the zero-order correlations are consistent with the theoretical model. For example, the indicators for mother's history of substance use problems are positively related to indicators for harsh/inconsistent parenting (e.g., $r = .14$, $p < .01$, for the relation between mother's history of drug use and hostility toward the target child. The same correlation for father's is .22, $p < .01$).

Table 1.2 presents the intercorrelations among constructs in the model. These correlations are based on estimates of the constructs using multiple indicators (e.g., friends' alcohol use is operationalized with two indicators, one involving target and the other sibling report). Consistent with the results for correlations between specific indicators, parent history of substance use correlated .33, $p < .001$, with mother's parenting (below the diagonal) and .36, $p < .001$, with father's parenting (above the diagonal). In addition, there were the expected positive correlations between target alcohol use at time 4 and earlier harsh/inconsistent parenting, earlier target drinking, sibling drinking, and friends' alcohol use. Because LISREL 7 (the software package used to generate these correlations) does not estimate the statistical significance of correlations between constructs, significance tests are not reported in Table 1.2.

Structural Equation Models

Latent-variable structural equation models were used to examine the empirical credibility of the proposed theoretical processes (Figure 1.1). Maximum likelihood estimates of the model coefficients were obtained using LISREL 7 (Joreskog & Sorbom, 1989). Models were first estimated separately for mothers and boys, mothers and girls, fathers and boys, and fathers and girls. Because there were no significant gender differences based on adolescent sex, we combined the boys and girls in the

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TABLE 1.1 INTERCORRELATIONS, MEANS AND STANDARD DEVIATIONS FOR ALL STUDY VARIABLES (INDICATORS FOR CONSTRUCTS): MOTHERS (*N*=371) BELOW AND FATHERS (*N*=368) ABOVE THE DIAGONAL

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	*M*	*SD*
Parent History of Substance Use																
1. Alcohol	27	30	06	11	06	02	13	09	14	12	04	08	09	2.60	1.41	
2. Drugs	52		22	03	06	00	-05	22	06	09	08	08	-02	09	2.67	1.30
3. Tobacco	39	43		-06	00	-01	03	15	11	08	04	00	03	01	3.64	1.52
Sibling Alcohol Use (T1)																
4. Frequency	04	09	11		78	15	18	04	11	07	18	29	15	11	.96	1.75
5. Problems	09	15	12	77		13	21	04	14	08	20	31	19	19	5.70	7.28
Target Alcohol Use (T1)																
6. Frequency	15	13	12	15	13		62	15	10	12	23	20	21	22	.52	1.13
7. Problems	19	14	07	18	21	61		09	07	09	20	17	25	24	4.66	6.14
Harsh/Inconsistent Parenting to Target (T2)																
8. Hostility	06	14	10	02	00	11	09		44	38	09	15	06	08	-.06	2.23
9. Inconsistent Discipline	10	19	08	14	18	16	16	48		43	15	13	11	11	-.07	2.57
10. Poor Child Monitoring	12	25	18	05	12	07	09	40	45		13	20	02	01	-.08	2.54
Friends' Alcohol Use (T3)																
11. Target Report	14	20	16	18	20	22	20	16	17	16		46	54	52	3.76	2.00
12. Sibling Report	11	09	11	29	30	20	17	17	17	23	46		33	27	1.81	1.02
Target Alcohol Use (T4)																
13. Frequency	17	18	19	15	19	19	24	10	16	15	53	33		78	2.36	3.00
14. Problems	17	17	24	11	18	20	23	13	17	16	50	27	78		12.56	2.87
M	1.90	2.66	3.04	.95	5.65	.51	4.59	.01	-.05	-.02	3.74	1.81	2.33	12.52	—	—
SD	.99	1.07	1.43	1.75	7.27	1.12	6.12	2.28	2.52	2.37	1.97	1.02	2.97	2.76	—	—

Note: For $r \geq .10$, $p < .05$; decimal points omitted; T1 = year 1 of the study, T2 = year 2, and so on.

TABLE 1.2 INTERCORRELATIONS AMONG THE THEORETICAL CONSTRUCTS: MOTHERS BELOW AND FATHERS ABOVE THE DIAGONAL

	(1)	(2)	(3)	(4)	(5)	(6)
1. Parent History of Substance Use		.13	.03	.36	.13	.04
2. Sibling Alcohol Use (T1)	.20		.24	.09	.34	.19
3. Target Alcohol Use (T1)	.26	.25		.20	.31	.34
4. Harsh/Inconsistent Parenting to Target (T2)	.33	.09	.23		.31	.12
5. Friends' Alcohol Use (T3)	.20	.31	.33	.37		.46
6. Target Alcohol Use (T4)	.14	.18	.32	.25	.51	

Note: T1 = year 1 of the study, T2 = year 2, and so on.

following analyses. We estimated the models separately for mothers and fathers because of some interesting differences in the findings.

In Figure 1.2, which presents the results for mothers, we first estimated the relationship between target alcohol use at time 4 (the 10th grade) and the exogenous variables (mother's history of substance problems, sibling alcohol use at time 1, and target adolescent alcohol use at time 1). As expected, the target adolescents demonstrated continuity in their use and abuse of alcohol as indicated by the significant standardized path coefficient (.27) from time 1 to time 4. In addition, mother's history significantly predicted increasing risk for target use (.20), as did sibling drinking (.13). That is, these risk factors within the family predicted later drinking by the target adolescents above and beyond their initial behavior. Moreover, mother, sibling, and target adolescent substance use were positively and significantly intercorrelated at time 1 (e.g., $r = .27$, $p < .01$, between sibling and target drinking).

This initial step in the analyses demonstrates significant direct relationships between the exogenous variables in the mother model and later target drinking behavior, with the impact of each variable an estimated net of the effects of the other two. These results are important in that the elimination of these significant direct paths by the introduction of the postulated mediating variables (harsh/inconsistent parenting and friends' substance use) would provide support for the hypothesized mediating processes. The goodness-of-fit index (GFI = .988) reported in Figure 1.2 also suggests a reasonable fit between this initial model and the data, as does the Critical N (CN = 557), which needs to be greater than 200 (Bollen, 1989). In addition,

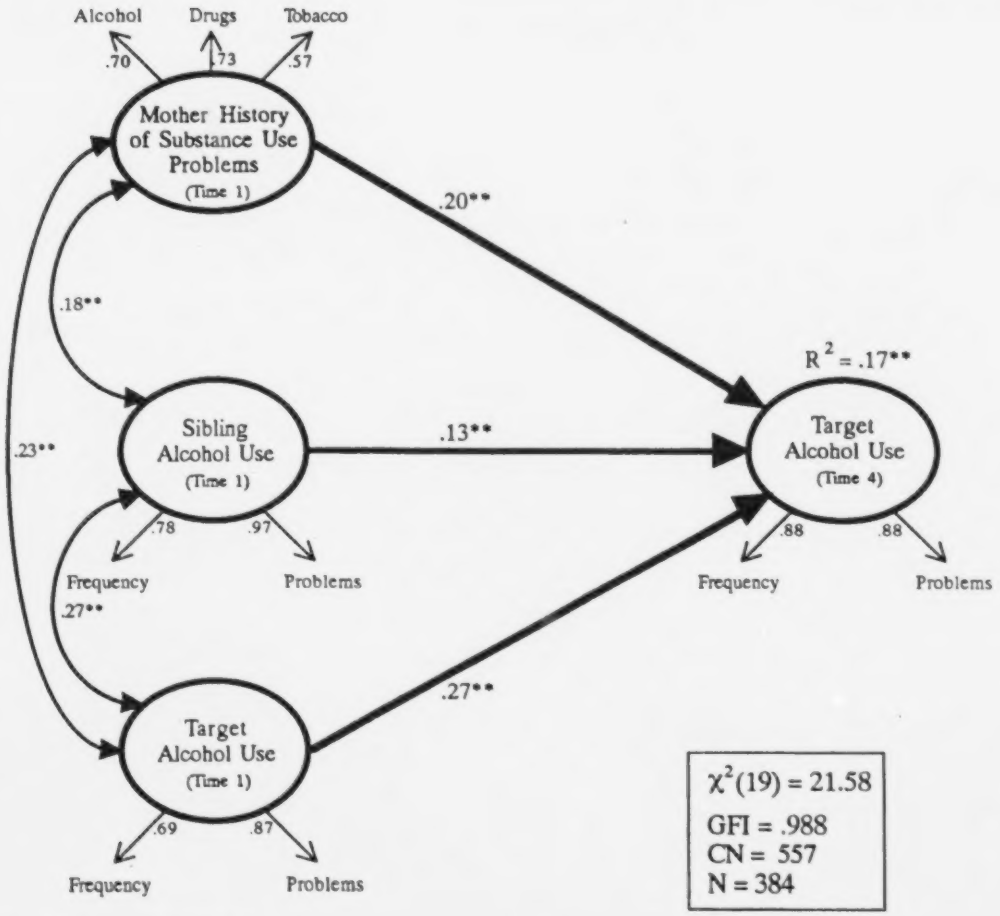

FIGURE 1.2 The direct effects model for mothers, maximum likelihood estimation of standardized regression coefficients.

Note: Because this model includes study variables from only Times 1 and 4, there are fewer missing cases and the total *N* increases to 384 (compared to 371 in the full model). + $p < .10$; * $p < .05$; ** $p < .01$.

all indicators were significantly related to their constructs, and this was true for all models tested in the following analyses.

Figure 1.3 reports the results of the initial model for fathers. As was the case for the mother model, the standardized regression coefficients show that both early target use (.31) and sibling alcohol use (.13) significantly predicted drinking behavior in the 10th grade. Father's history of substance use problems, however, was only marginally related to later target alcohol use (.09). Moreover, father's history of substance use was not significantly related to target drinking at time 1, contrary to the findings for mothers. The fit indexes suggested a good match between the model and the data.

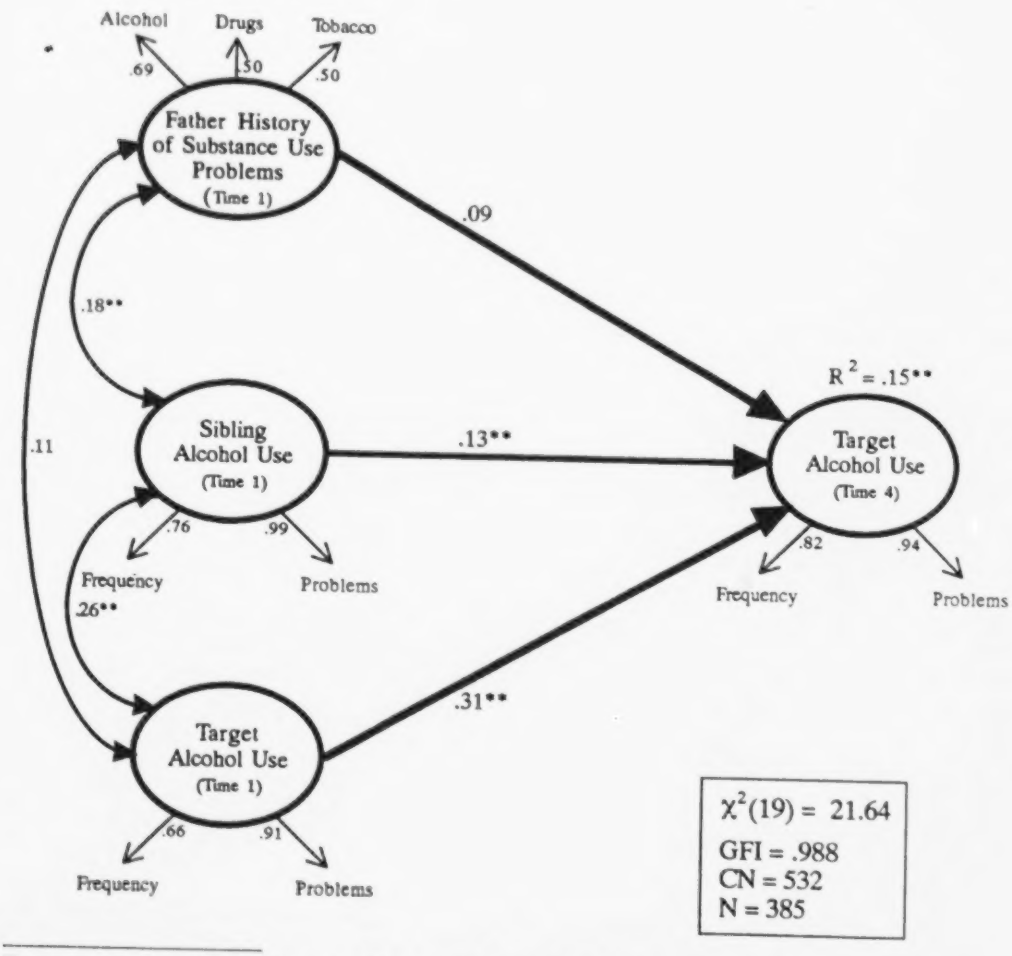

FIGURE 1.3 The direct effects model for fathers, maximum likelihood estimation of standardized regression coefficients.

Note: Because this model includes study variables from only Times 1 and 4, there are fewer missing cases and the total *N* increases to 385 (compared to 368 in the full model). + $p < .10$; * $p < .05$; ** $p < .01$.

The next stage in the analyses considered the fit between the full model (Figure 1.1) and the data. Consistent with the hypothesized causal processes, the findings reported in Figure 1.4 show that mother's history of substance use problems significantly predicts harsh/inconsistent parenting, as does time 1 target alcohol use. Separate analyses showed that, as expected, there was no significant association between sibling alcohol use and parenting toward the target adolescent. The findings support the idea that harsh parenting to the target adolescent is exacerbated specifically by that child's behavior rather than being a more general response to all children in the household. In addition, the results show that harsh/inconsistent parenting at time

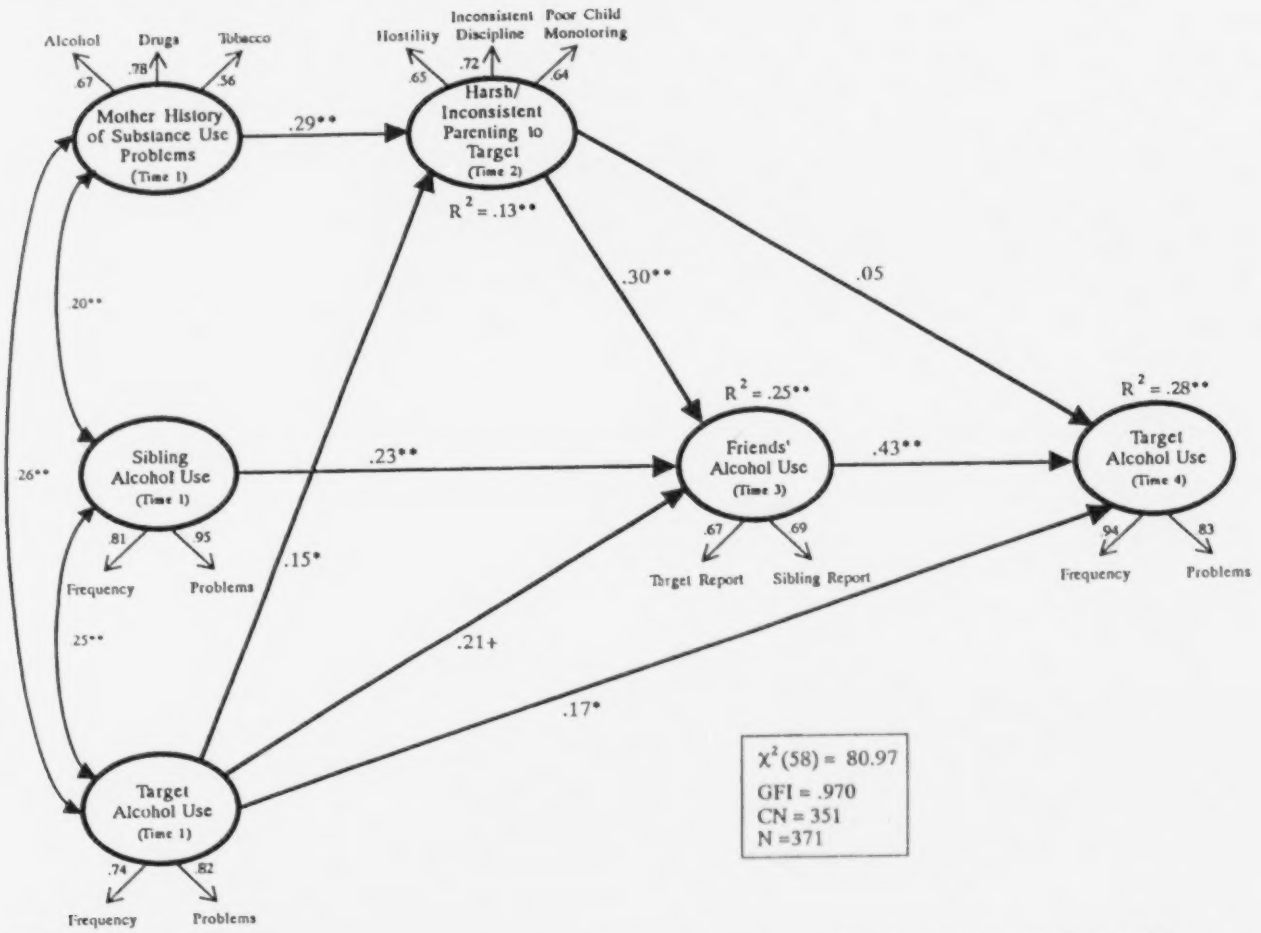

FIGURE 1.4 Maximum likelihood estimation of the theoretical model for mothers, standardized regression coefficients.

+ $p < .10$; * $p < .05$; ** $p < .01$.

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2, sibling drinking at time 1, and target drinking at time 1 are all significant predictors of friends' drinking behavior at time 3.

As expected, separate analyses showed that sibling alcohol use did not predict later target drinking after friends' use was entered into the model, suggesting the existence of the postulated mediating effect. Moreover, the direct path from mother's substance use problems to friends' use was not statistically significant with the parenting variable in the model. Target's early drinking did relate directly to later alcohol use, but harsh/inconsistent parenting did not. Both sibling and parent influences appear to be indirect through their association with the acquisition by the target adolescent of friends who drink. In addition, the fit indexes suggest a good match between the proposed model and the data (GFI = .970).

The next stage in the analyses evaluated the fit of the data with the full model for fathers. As shown in Figure 1.5, the findings were quite comparable to those for mothers. Except for the direct path from parenting to time 4 alcohol use, the predicted relationships among constructs were all statistically significant. Moreover, parent and sibling effects were all indirect through the friends construct, that is, estimating the direct paths from these variables to time 4 target drinking with the friends construct in the model produced only nonsignificant findings. The results also demonstrate a good fit between the full model and the data (GFI = .972).

To complete the analyses, we examined the statistical significance of the indirect and total effects of the predictor variables on later constructs in the full model. The purpose of these analyses is to assure that postulated indirect effects are statistically significant. The results reported in Table 1.3 (mother's model) show, for example, that mother's history of substance use problems has a significant indirect effect on the target adolescent's involvement in friendships with peers who drink (.17, unstandardized regression coefficient) and on target adolescent drinking at time 4 (.22). Unstandardized regression coefficients are reported consistent with available software (LISREL 7).

For the mother model, the findings in Table 1.3 also show the expected indirect effect of sibling drinking on later alcohol use by the target adolescent. In addition, target alcohol use in the 7th grade had a marginally significant indirect effect (through parenting behavior) on later association with friends who drink (.07), and a significant indirect association with own alcohol use in the 10th grade (.40). Finally, harsh/inconsistent parent-

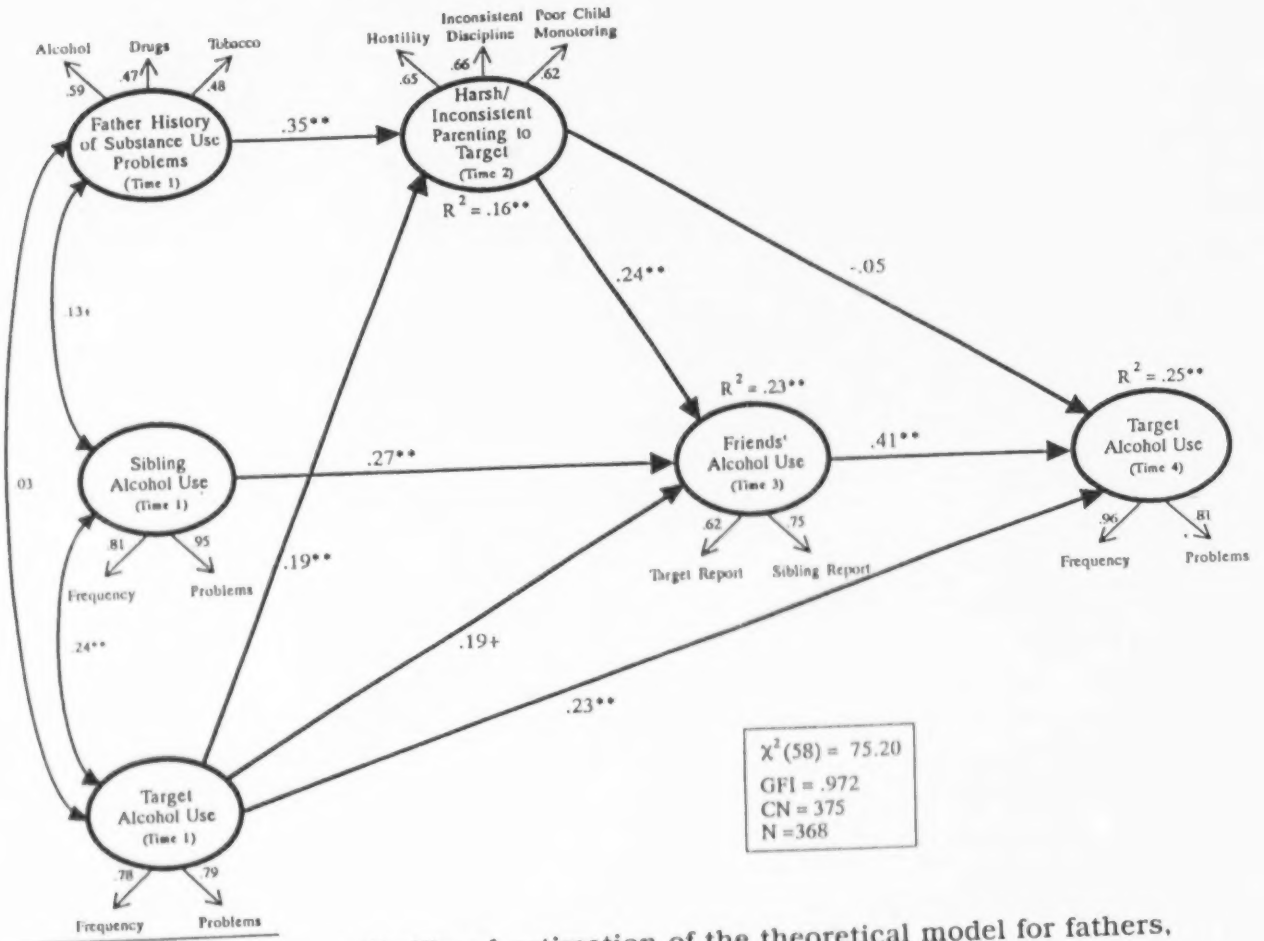

FIGURE 1.5 Maximum likelihood estimation of the theoretical model for fathers, standardized regression coefficients.

+ $p < .10$; * $p < .05$; ** $p < .01$.

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TABLE 1.3 INDIRECT AND TOTAL EFFECTS FOR THE PREDICTOR VARIABLES FOR THE MOTHER MODEL (UNSTANDARDIZED COEFFICIENTS)

	Predictor Variables									
	(1)		(2)		(3)		(4)		(5)	
Predictor Variables	**Indirect Effects**	**Total Effects**	**Indirect Effects**	**Total Effects**	**Indirect Effects**	**Total Effects**	**Indirect Effects**	**Total Effects**	**Indirect Effects**	**Total Effects**
1. Parent History of Substance Use										
2. Sibling Alcohol Use (T1)										
3. Target Alcohol Use (T1)										
4. Harsh/Inconsistent Parenting (T2)		.65**				.27*				
5. Friends' Alcohol Use (T3)	.17**	.17**		.21**	.07+	.41*		.27**		
6. Target Alcohol Use (T4)	.22*	.22*	.19**	.19**	.40*	.95**	.25**	.34**		.92**

Note: +$p < .10$; *$p < .05$; **$p < .01$; T1 = year 1 of the study, T2 = year 2, and so on.

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ing had the expected indirect relation with target drinking through its association with deviant peers (.25). The findings reported in Table 1.4 for fathers are essentially the same as for mothers with one important exception; there was no significant indirect effect of fathers' substance use problems on later target drinking.

DISCUSSION

In this chapter we attempted to trace a set of social influences from family processes to peer relations that was hypothesized to increase risk for adolescent drinking and drinking problems during the transition from early to middle adolescence. The model that guided the study proposed that, over time, family influences on adolescent alcohol use give way to the direct effects of friends on the tendency to drink prior to reaching the legal age for that behavior. According to the theoretical model, the long-term consequences of family risks for involvement with alcohol are realized primarily through sibling and parent activities that legitimize, encourage, or fail to inhibit association with friends who will act as models and, perhaps, as sources of social pressure to drink. This report specifically addressed the usually neglected role of siblings in family influences on drinking behavior (Barnes, 1990).

Sibling Relations

In general, the results were consistent with the model. Considering first the role of siblings, the findings supported the hypothesis that frequent and problematic drinking by siblings would exacerbate the target adolescent's tendency to drink. The data demonstrated the role of siblings in this risk process in two ways. First, sibling drinking at time 1 was positively and significantly related to target drinking during the same time period. This outcome, of course, likely represents reciprocal influences between the two adolescents. Such bidirectional effects are consistent with our notion that alcohol use by a near-age sibling is a risk factor for adolescent drinking. Indeed, Lauritsen (1993) has shown that younger as well as older siblings tend to promote one another's deviant activities.

TABLE 1.4 INDIRECT AND TOTAL EFFECTS FOR THE PREDICTOR VARIABLES FOR THE FATHER MODEL (UNSTANDARDIZED COEFFICIENTS)

	Predictor Variables									
	(1)		(2)		(3)		(4)		(5)	
Predictor Variables	**Indirect Effects**	**Total Effects**	**Indirect Effects**	**Total Effects**	**Indirect Effects**	**Total Effects**	**Indirect Effects**	**Total Effects**	**Indirect Effects**	**Total Effects**
1. Parent History of Substance Use										
2. Sibling Alcohol Use (T1)										
3. Target Alcohol Use (T1)										
4. Harsh/Inconsistent Parenting (T2)		.61**				.32**				
5. Friends' Alcohol Use (T3)	.13*	.13*		.24**	.07·	.34·		.21**		
6. Target Alcohol Use (T4)	.05	.05	.22**	.22**	.29	1.03**	.19*	.09		.95**

Note: ·$p < .10$; *$p < .05$; **$p < .01$; T1 = year 1 of the study, T2 = year 2, and so on.

Across time, the sibling role appears to change inasmuch as sibling drinking is directly related to target's selection of friends who drink, but only indirectly related to later target drinking through involvement with deviant peers. This sequence of relationships was predicted by the theoretical model. The important point generated by these findings is that siblings appear to have both a concurrent, direct effect and a delayed, indirect effect on a brother's or sister's risk of becoming a heavy drinker. As suggested by Barnes (1990), social influences involving sibling relations within the family appear to generalize to the outside social world as adolescents select into peer groups that maintain these problematic social conditions. We suspect that alcohol-using siblings legitimize in some important ways their brothers' and sisters' association with friends who drink. Future research should examine the possibility of specific legitimizing mechanisms. Moreover, further analyses are needed to determine whether sibling and peer drinking reciprocally affect each other and whether this dynamic involves both direct and indirect effects on adolescent behavior for both siblings and peers.

Deviance Amplification

As expected, the seventh-grade target children also contributed to this selection process. Indeed, early drinking appeared to exacerbate or amplify other dimensions of social risk. For example, target adolescents who were drinking in the seventh grade were more likely to acquire friends who drink, as reported both by themselves and their siblings. This "flocking" phenomenon may represent the frequently observed tendency for individuals to select friends with interests and dispositions similar to their own (Gottfredson & Hirschi, 1990). The selection process may also involve rejection by more conventional peers who are not attracted by deviant activities such as serious involvement with alcohol at a relatively early age (14 or 15 years old). As Patterson and his colleagues (1992) suggested, selection into deviant peer groups may represent the end result of failures in meeting conventional standards for behavior as much as active seeking of such associations. Thus, risk processes within the family that exacerbate the tendency to drink may also inhibit the development of more conventional friendship ties that would promote more age-appropriate behavior.

Target adolescent drinking in the seventh grade also appears to generate more harsh and inconsistent behavior by parents, perhaps in response to the stress of dealing with early-onset deviant activities. As predicted, such behavior by parents was also associated with selection into groups of friends who drink. Thus, early drinking behavior by the target adolescents apparently helped to set in motion a set of social processes that increased risk for later drinking behavior and related problems. These indirect pathways that are related to early drinking appear to operate additively and independently of predicted continuity in deviant behaviors. That is, early drinking was directly related to later drinking by the target adolescents; however, sibling, parent, and friend characteristics had an influence on later drinking that was statistically significant and independent of such continuity.

These results are consistent with the idea that youngsters with problems are both victims and shapers of life conditions that promote problem behaviors (Sampson & Laub, 1993). The present findings suggest that family context certainly contributes to later risks for potentially injurious behavior, and also that early-onset risk taking by the adolescent intensifies this process. But what more can we say about the role of parents?

Parents' Behaviors

We proposed that parent history of substance use problems would be indirectly related to adolescent risk for later alcohol use. The findings were consistent with this hypothesis, although they were somewhat stronger for mothers than for fathers. Mother's substance use history was positively and significantly related to both sibling and target adolescent drinking at time 1, whereas father's substance use history was related only to sibling drinking during the first year of the study. For both mothers and fathers, there was a significant relationship between substance use problems and harsh/inconsistent parenting, but parenting behavior had no direct association with time 4 adolescent drinking with the friends' construct in the model. Parenting behavior, however, was directly related to peer associations. Finally, there was no direct relation between parents' substance use history and later target drinking when the hypothesized mediating variables were included in the analyses.

The results, then, are consistent with our thesis that a history of parent substance use problems can be treated as a

source of stress that disrupts parenting behavior. These disruptions reduce parent effectiveness in controlling deviant activities, including involvement with friends who use alcohol. As predicted, the strongest proximal predictor of adolescent drinking in the 10th grade was associating with friends who use alcohol. These findings are consistent with our prediction that family influences on later risk operate primarily by helping to shape the outside social environment of the adolescent. It is this environment, we expect, that will play the most significant direct role in affecting adolescent behavior through high school and into the post-high school years.

But why did mothers' history of substance use problems have both the strongest concurrent and delayed indirect influences on adolescent drinking? We suggested elsewhere (Conger et al., 1994) that because serious substance problems among mothers are more rare than among fathers, they represent a more extreme form of deviant behavior. That is, mothers' involvement with substances may do more to legitimize such act-ivities than does fathers' use. It may also be the case that because mothers generally play a more significant role in early childrearing, their substance use has more negative influences prior to the seventh grade. The harmful consequences of these disruptions in maternal childrearing during the preadolescent years may just be beginning to express themselves at a time concurrent with the initiation of our study. Because our study began during early adolescence, we were unable to examine these earlier influences. Future research needs to address this question.

Denise Kandel (personal communication, 1993) suggested to us that the findings may also represent a prenatal influence. That is, if many of these mothers were using substances during pregnancy, these children may have directly participated in that use, creating a degree of psychological dependency that comes to the fore during adolescence. This hypothesis is also deserving of future study.

In any case, the results presented here demonstrate, across time, important connections among sibling, parent, and target adolescent drinking behavior. These associations identify several points in the risk process that might be targeted for intervention or prevention programs, such as the link between parent substance use and disrupted parenting behavior. The longitudinal nature of the study, along with the multiple-informant approach to measurement of key constructs, increases our confidence in the robustness of the findings. The generalizability of the re-

sults, however, remains to be established with different populations (e.g., rural as well as urban, minority as well as majority), with different age adolescents and children, and across longer periods of time. Nevertheless, the results to this point support our thesis that siblings need to be included in family studies of substance use. The behaviors of parents alone provide only an incomplete picture of the family processes that create risk for adolescent drinking problems.

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